#3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Chang et al.**

Serial No.: **09/737,430**

Filing Date: **12/15/2000**

For: **Method and system for unambiguous addressability in a distributed application framework in which duplicate network addresses exist across multiple customer networks**

§ Group Art Unit: **2153**
§
§ Examiner: **Unknown**
§
§ Attorney Docket No.: **AUS9-2000-0698-US1**
§

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on May 30, 2001.

By: _____
Joseph R. Burwell, Reg. No 44,468

LETTER TO OFFICIAL DRAFTSPERSON

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Submitted herewith are formal drawings (12 sheets) for the above-identified application.

DATE: May 30, 2001

Respectfully submitted,

_____
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Reg. No. 44,468
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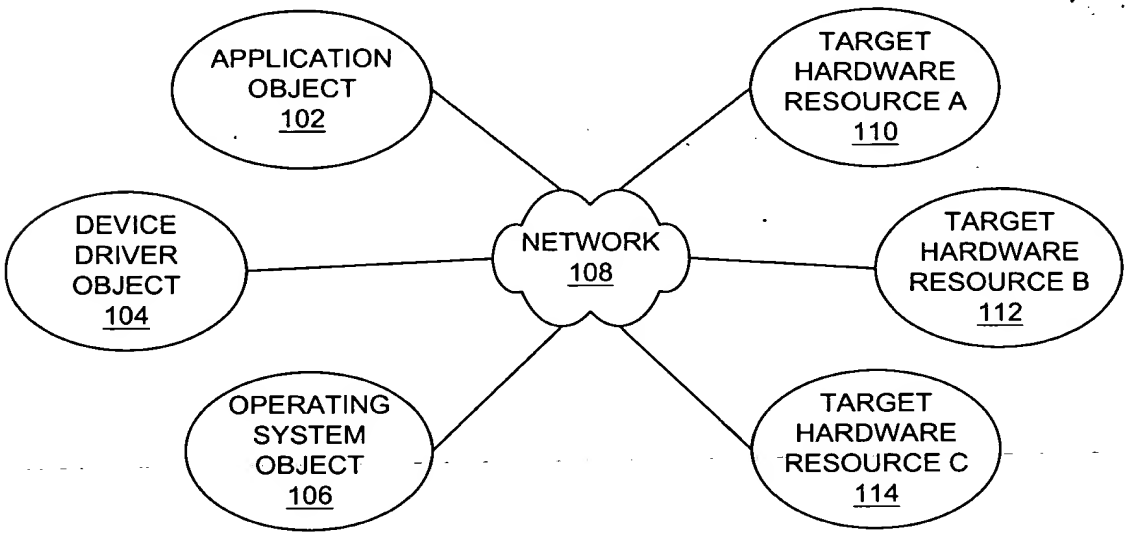

FIG. 1A
(PRIOR ART)

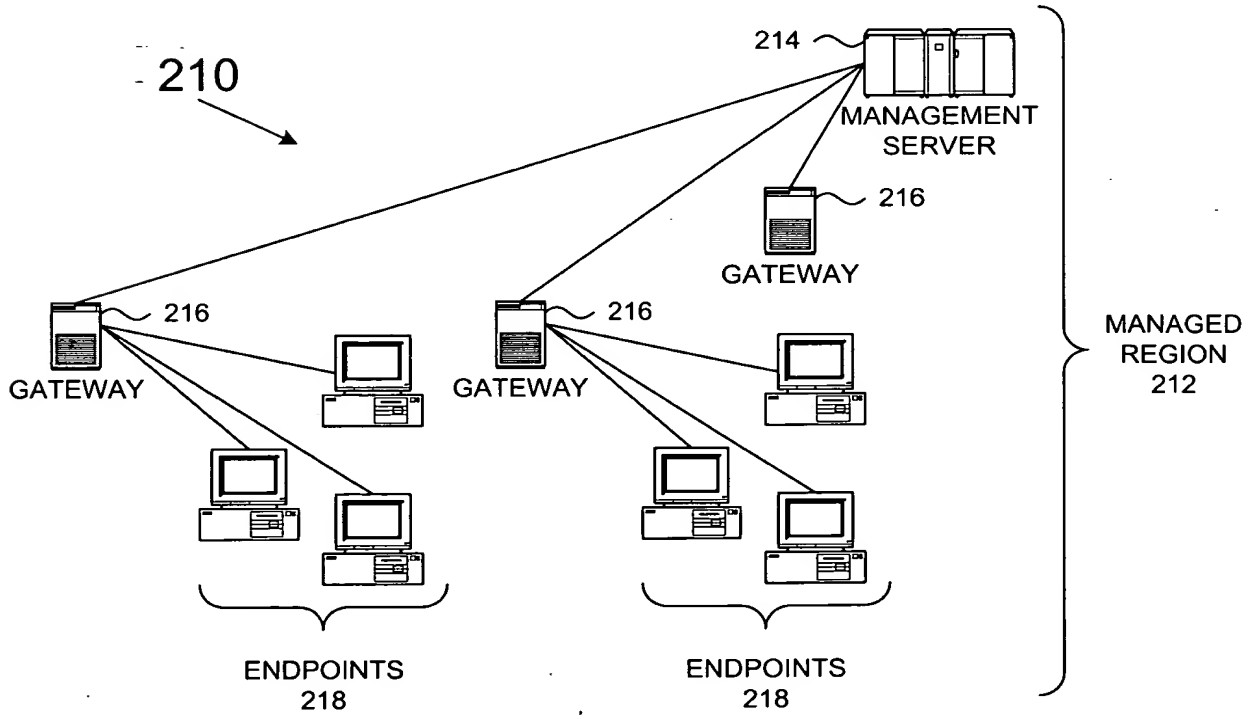

FIG. 2A

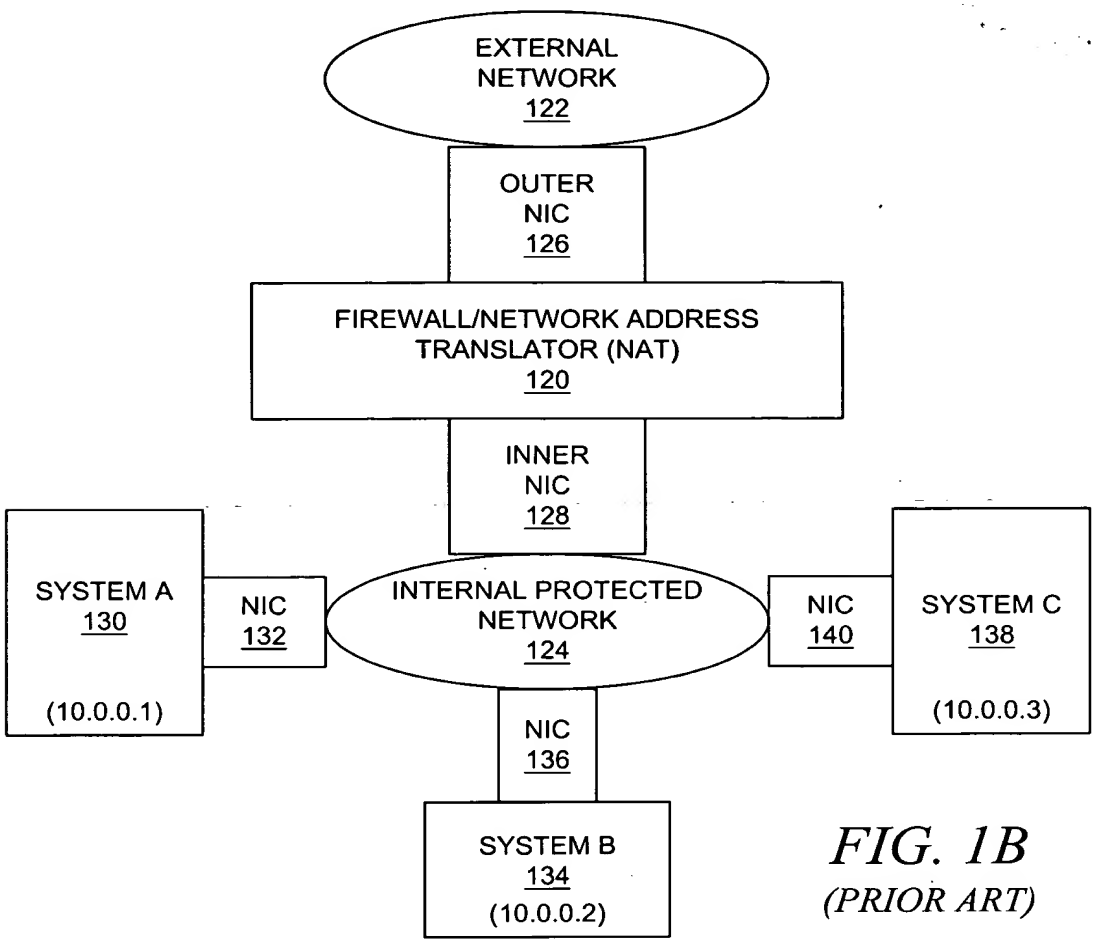

FIG. 1B
(PRIOR ART)

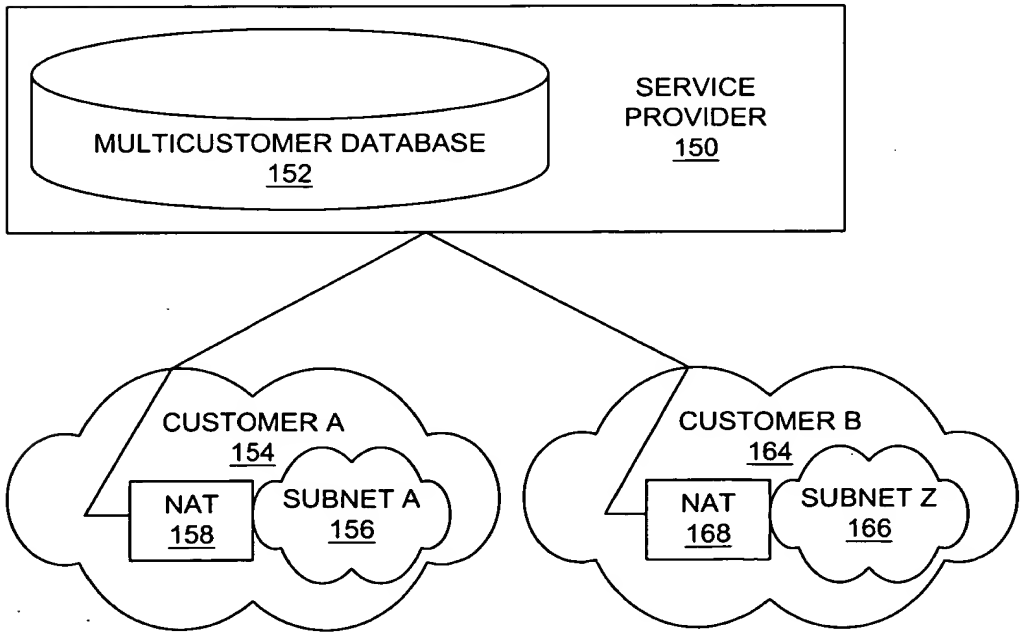

FIG. 1C

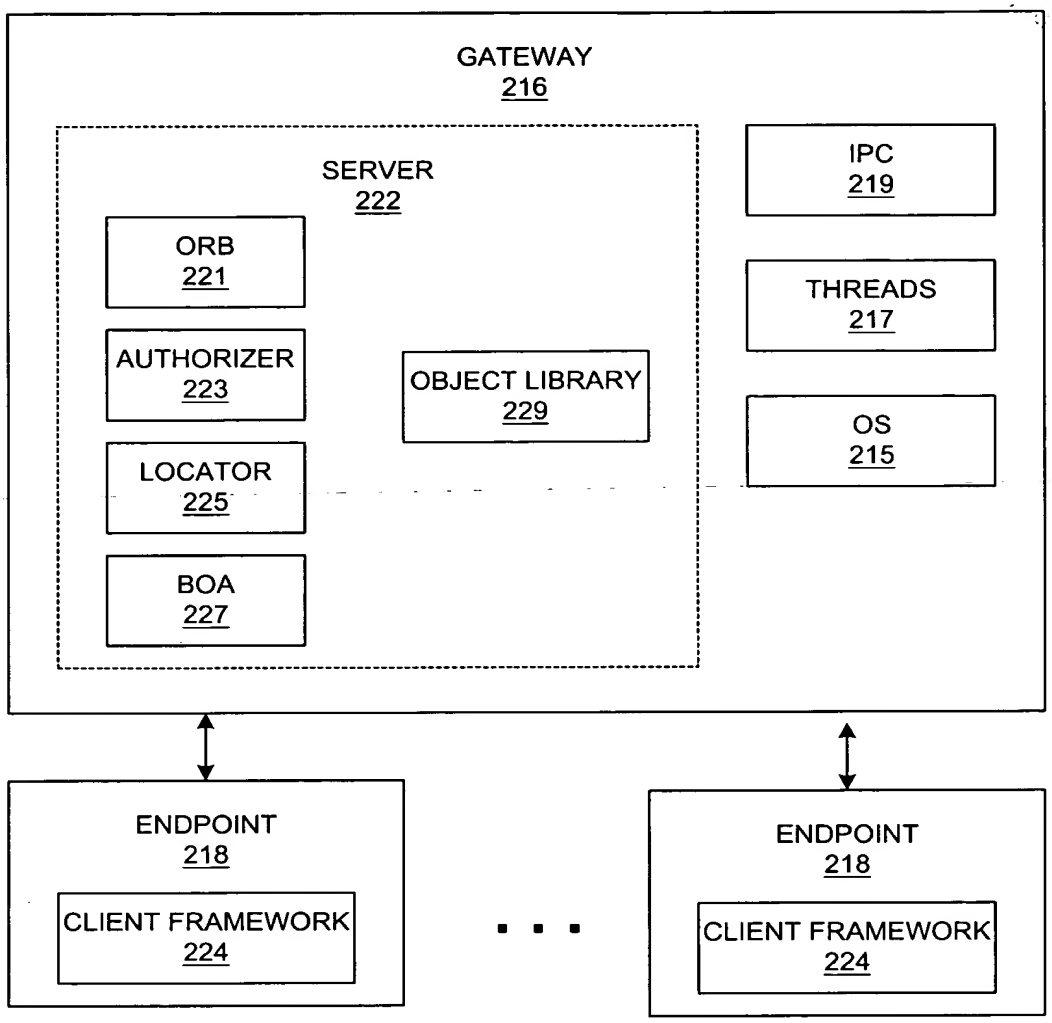
GATEWAY
216
SERVER
222
ORB
221
AUTHORIZER
223
LOCATOR
225
BOA
227
OBJECT LIBRARY
229
IPC
219
THREADS
217
OS
215
ENDPOINT
218
CLIENT FRAMEWORK
224
ENDPOINT
218
CLIENT FRAMEWORK
224

FIG. 2B

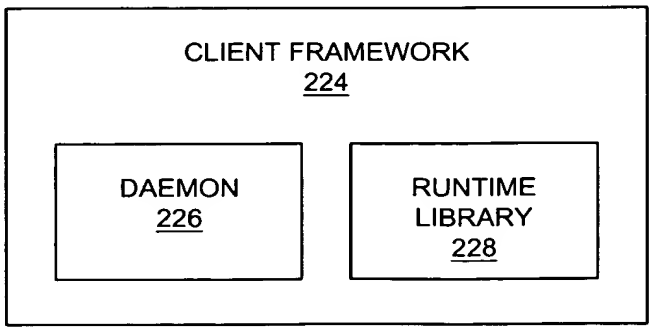
CLIENT FRAMEWORK
224
DAEMON
226
RUNTIME
LIBRARY
228

FIG. 2C

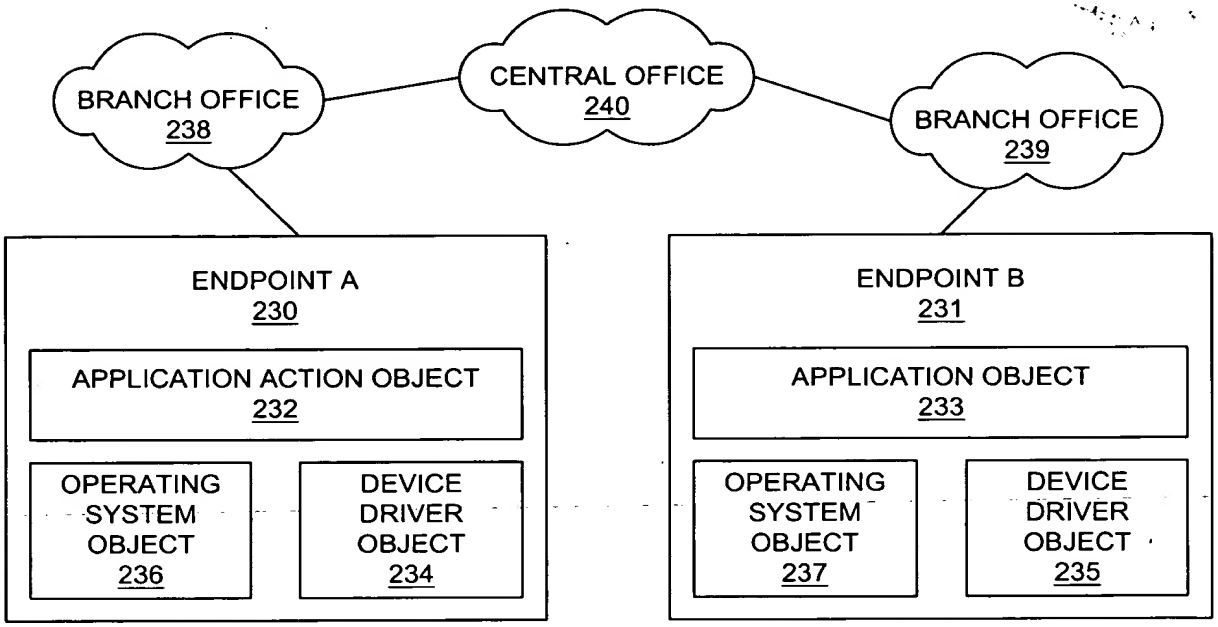
BRANCH OFFICE
238
CENTRAL OFFICE
240
BRANCH OFFICE
239
ENDPOINT A
230
APPLICATION ACTION OBJECT
232
OPERATING SYSTEM OBJECT
236
DEVICE DRIVER OBJECT
234
ENDPOINT B
231
APPLICATION OBJECT
233
OPERATING SYSTEM OBJECT
237
DEVICE DRIVER OBJECT
235

FIG. 2D

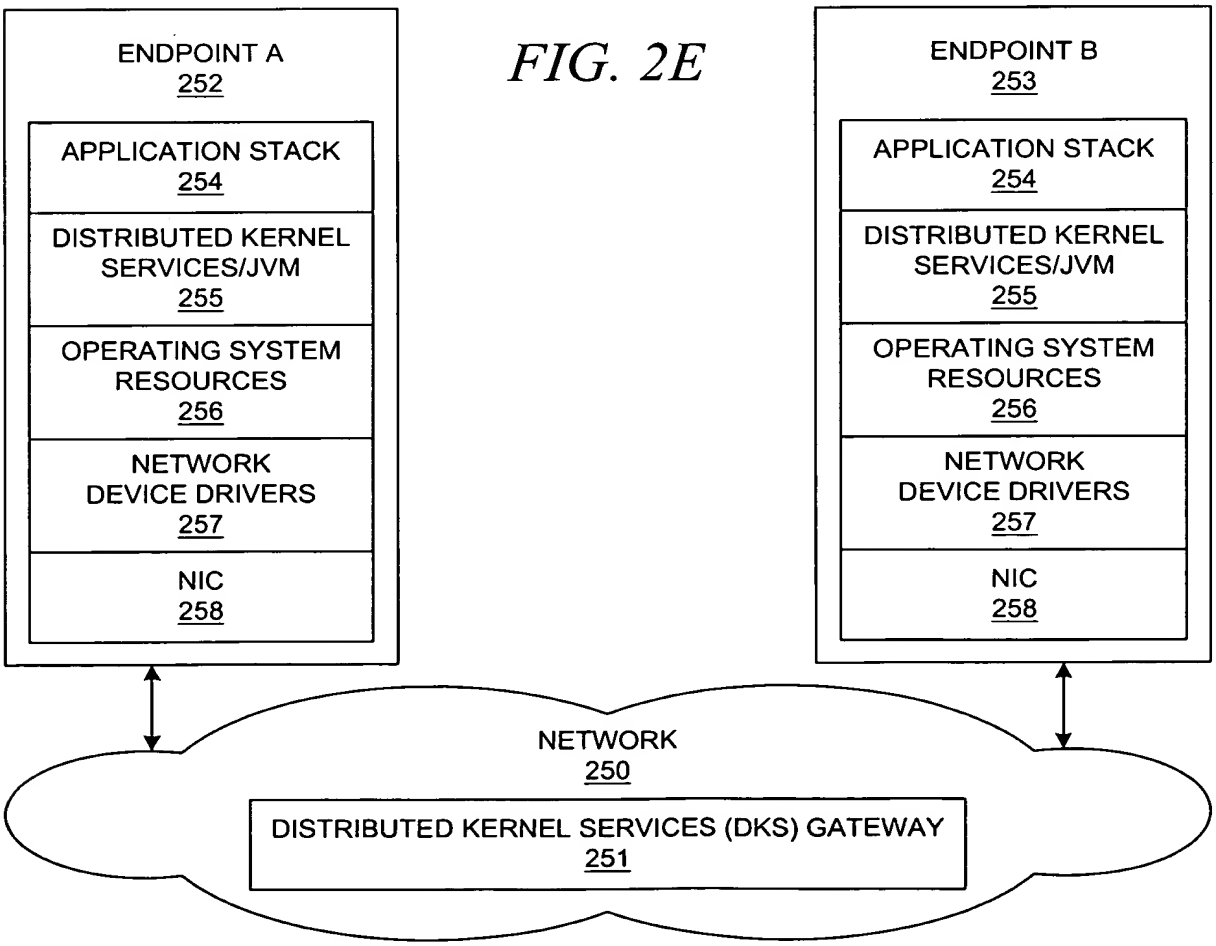
ENDPOINT A
252
APPLICATION STACK
254
DISTRIBUTED KERNEL SERVICES/JVM
255
OPERATING SYSTEM RESOURCES
256
NETWORK DEVICE DRIVERS
257
NIC
258
ENDPOINT B
253
APPLICATION STACK
254
DISTRIBUTED KERNEL SERVICES/JVM
255
OPERATING SYSTEM RESOURCES
256
NETWORK DEVICE DRIVERS
257
NIC
258
NETWORK
250
DISTRIBUTED KERNEL SERVICES (DKS) GATEWAY
251

FIG. 2E

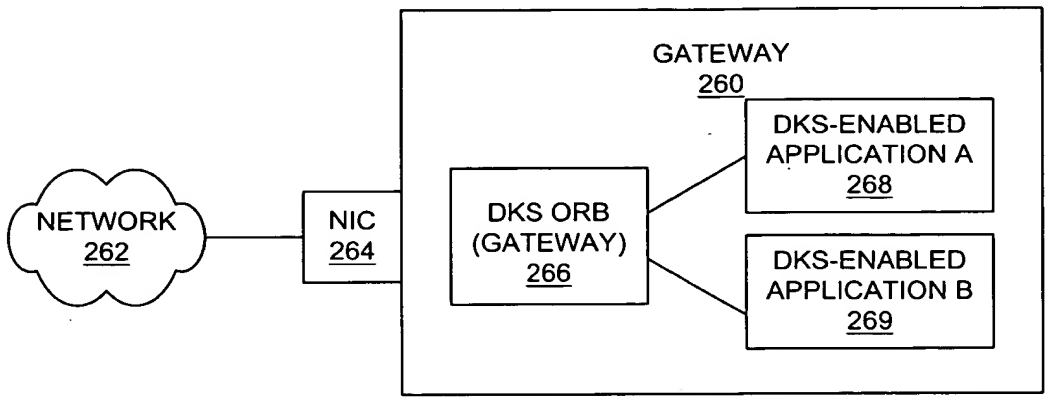
GATEWAY
260
DKS-ENABLED
APPLICATION A
268
DKS-ENABLED
APPLICATION B
269
DKS ORB
(GATEWAY)
266
NIC
264
NETWORK
262

FIG. 2F

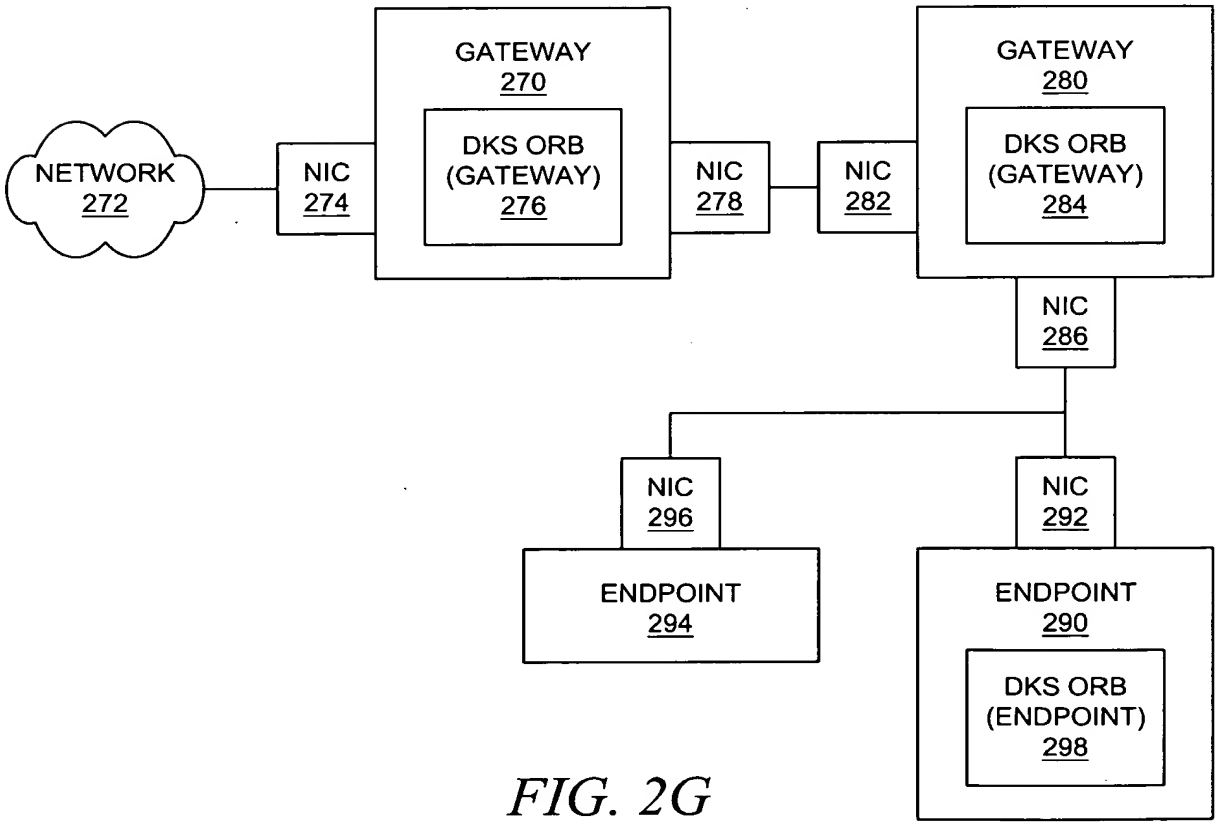
GATEWAY
270
DKS ORB
(GATEWAY)
276
GATEWAY
280
DKS ORB
(GATEWAY)
284
NETWORK
272
NIC
274
NIC
278
NIC
282
NIC
286
NIC
296
NIC
292
ENDPOINT
294
ENDPOINT
290
DKS ORB
(ENDPOINT)
298

FIG. 2G

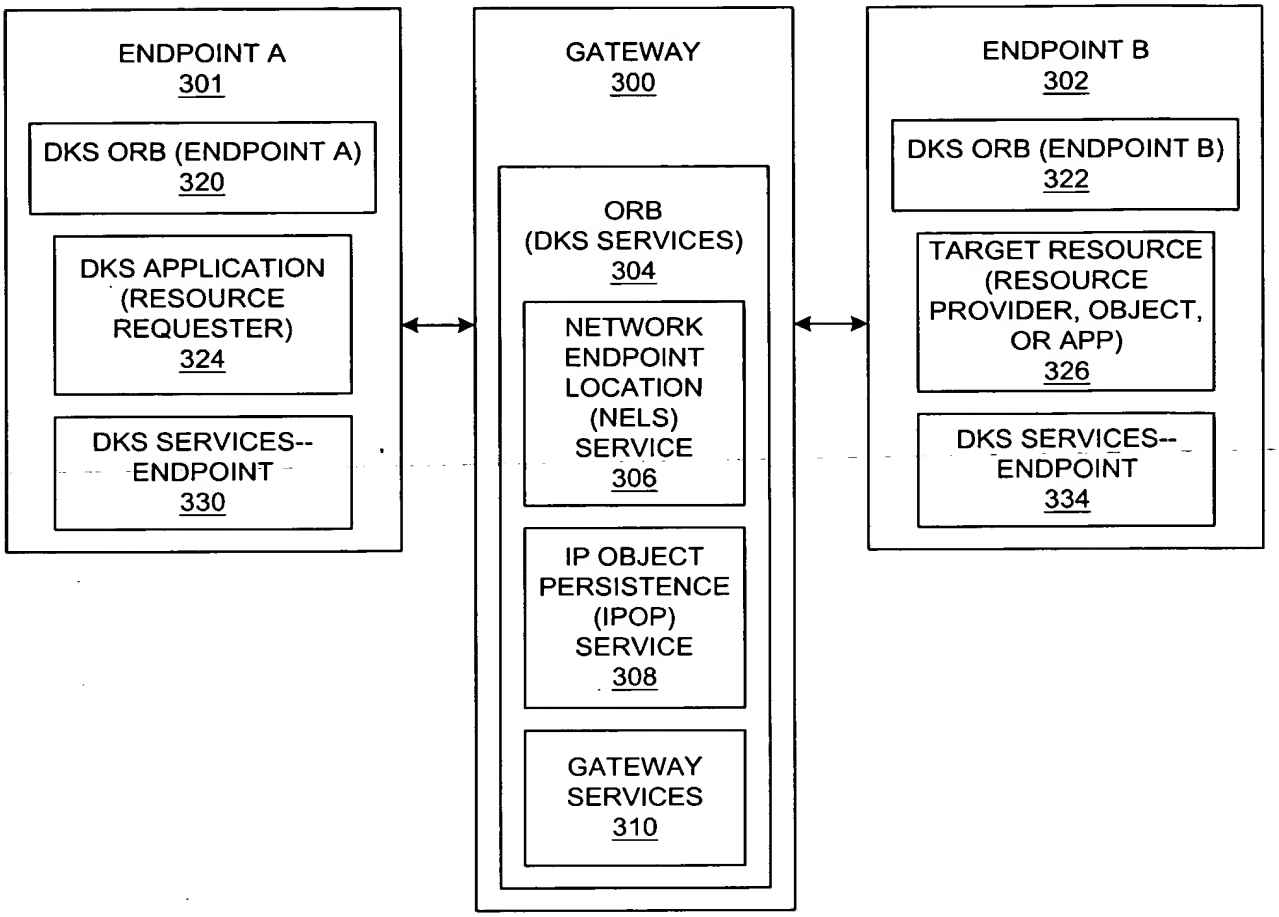
ENDPOINT A
301
DKS ORB (ENDPOINT A)
320
DKS APPLICATION (RESOURCE REQUESTER)
324
DKS SERVICES-- ENDPOINT
330
GATEWAY
300
ORB (DKS SERVICES)
304
NETWORK ENDPOINT LOCATION (NELS) SERVICE
306
IP OBJECT PERSISTENCE (IPOP) SERVICE
308
GATEWAY SERVICES
310
ENDPOINT B
302
DKS ORB (ENDPOINT B)
322
TARGET RESOURCE (RESOURCE PROVIDER, OBJECT, OR APP)
326
DKS SERVICES-- ENDPOINT
334

FIG. 3

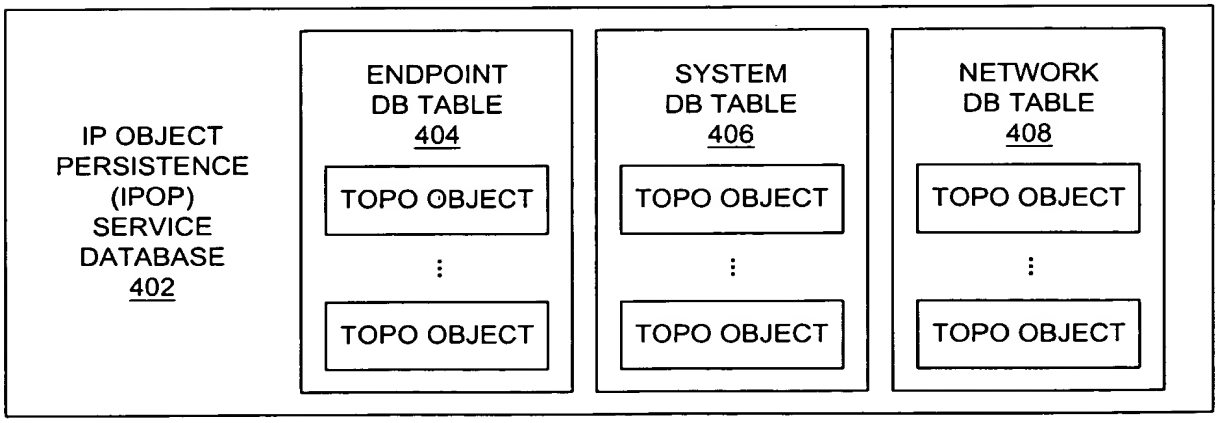
IP OBJECT PERSISTENCE (IPOP) SERVICE DATABASE
402
ENDPOINT DB TABLE
404
TOPO OBJECT
TOPO OBJECT
SYSTEM DB TABLE
406
TOPO OBJECT
TOPO OBJECT
NETWORK DB TABLE
408
TOPO OBJECT
TOPO OBJECT

FIG. 4

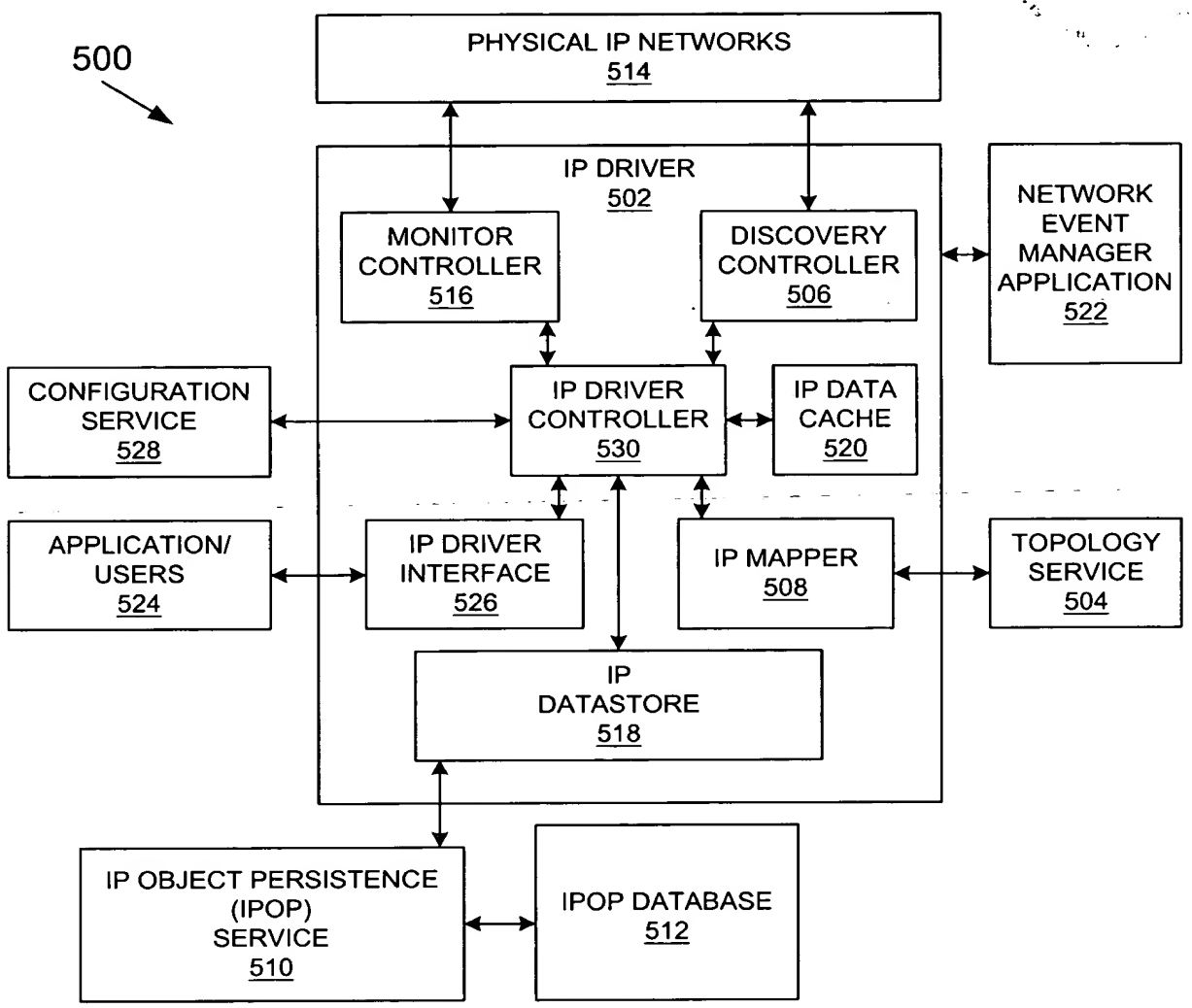
500
PHYSICAL IP NETWORKS
514
IP DRIVER
502
MONITOR CONTROLLER
516
DISCOVERY CONTROLLER
506
NETWORK EVENT MANAGER APPLICATION
522
CONFIGURATION SERVICE
528
IP DRIVER CONTROLLER
530
IP DATA CACHE
520
APPLICATION/ USERS
524
IP DRIVER INTERFACE
526
IP MAPPER
508
TOPOLOGY SERVICE
504
IP DATASTORE
518
IP OBJECT PERSISTENCE (IPOP) SERVICE
510
IPOP DATABASE
512

FIG. 5A

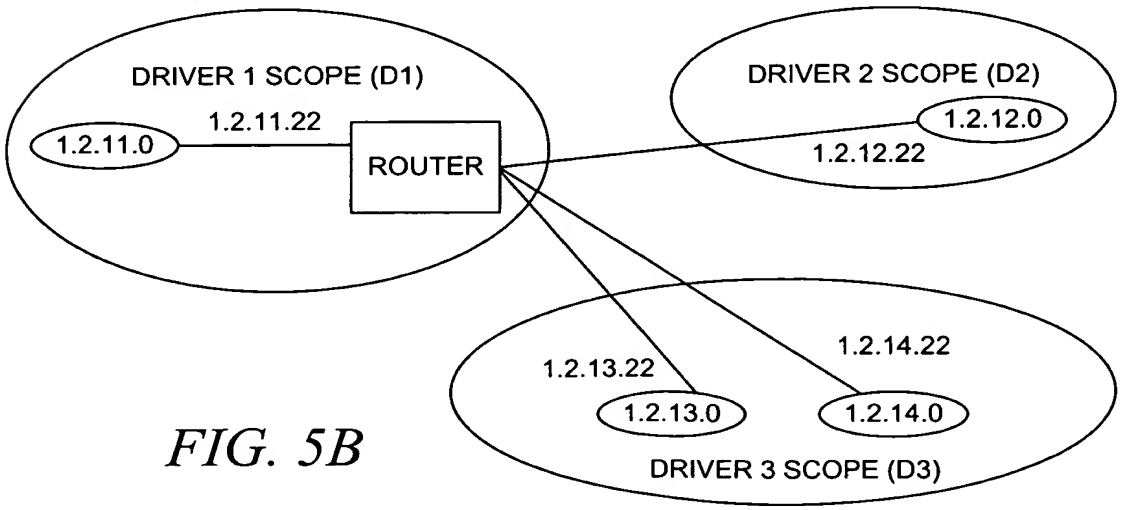
DRIVER 1 SCOPE (D1)
1.2.11.0
1.2.11.22
ROUTER
DRIVER 2 SCOPE (D2)
1.2.12.0
1.2.12.22
1.2.13.22
1.2.13.0
1.2.14.22
1.2.14.0
DRIVER 3 SCOPE (D3)

FIG. 5B

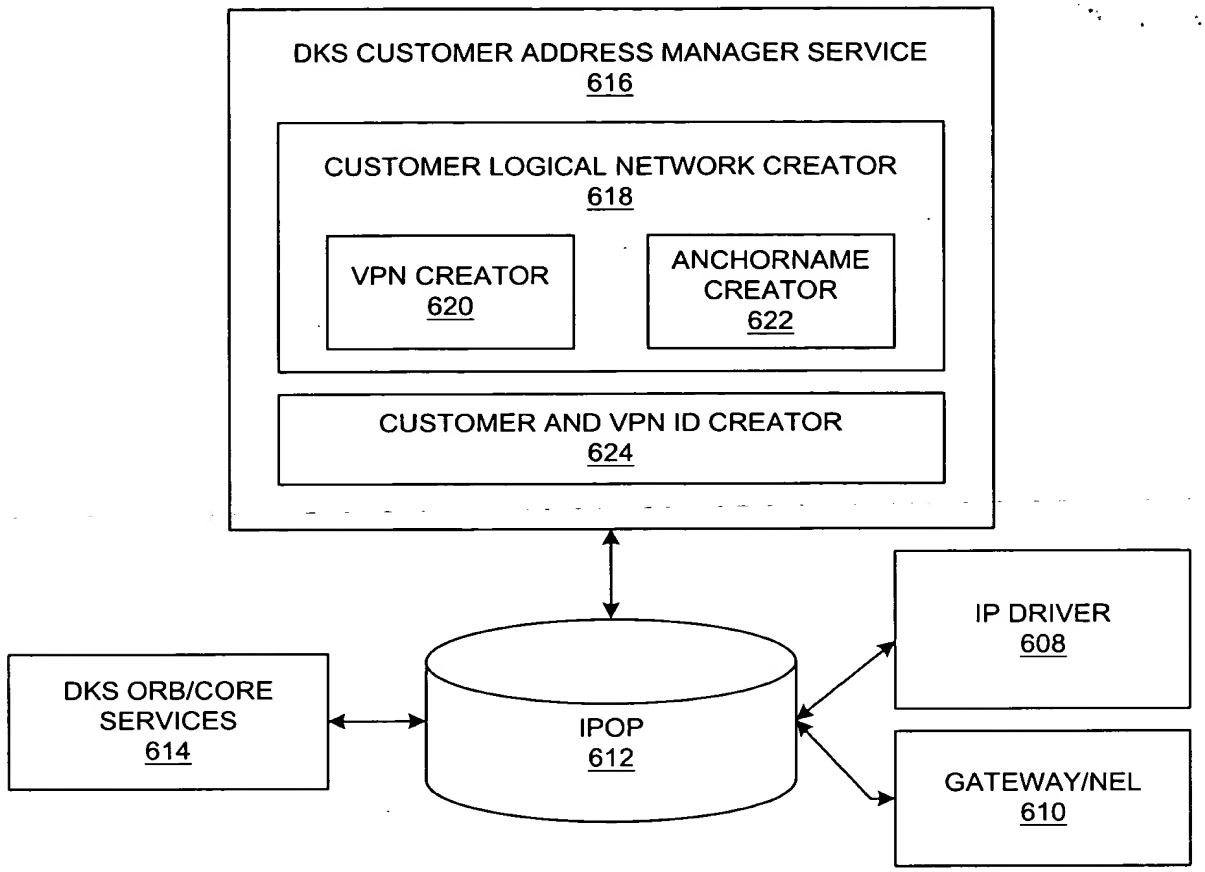
DKS CUSTOMER ADDRESS MANAGER SERVICE
616
CUSTOMER LOGICAL NETWORK CREATOR
618
VPN CREATOR
620
ANCHORNAME CREATOR
622
CUSTOMER AND VPN ID CREATOR
624
DKS ORB/CORE SERVICES
614
IPOP
612
IP DRIVER
608
GATEWAY/NEL
610

FIG. 6A

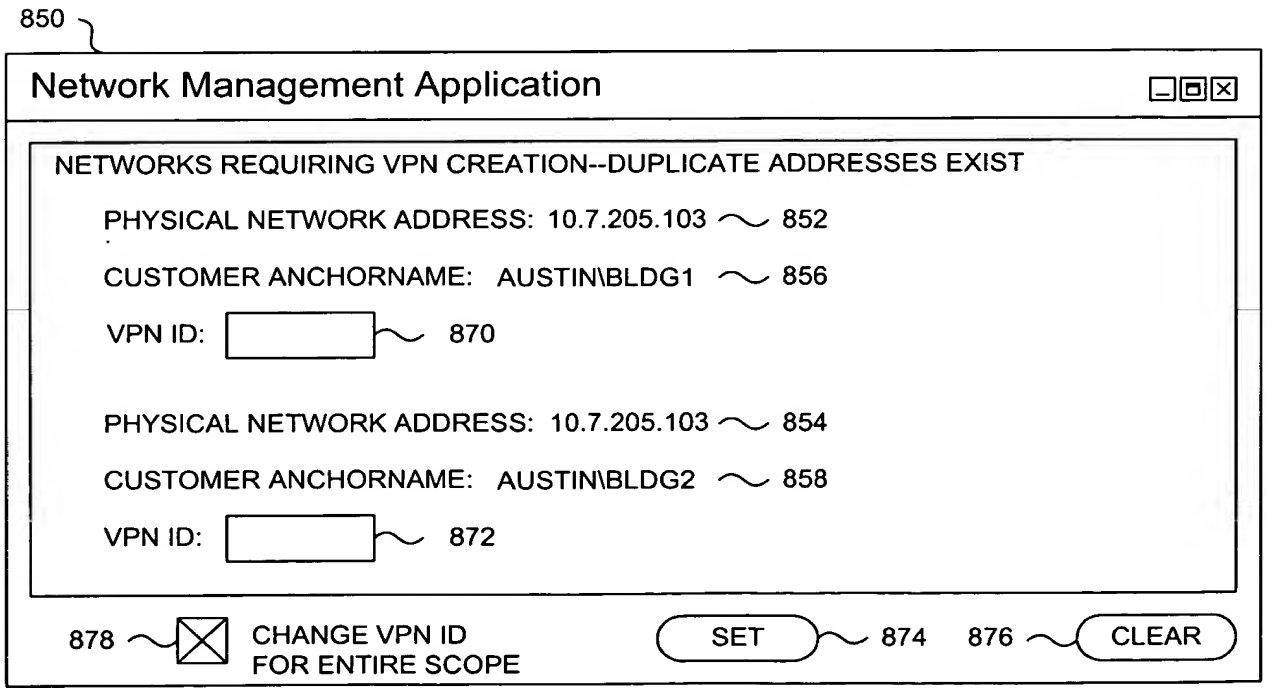
850
Network Management Application
NETWORKS REQUIRING VPN CREATION--DUPLICATE ADDRESSES EXIST
PHYSICAL NETWORK ADDRESS: 10.7.205.103
852
CUSTOMER ANCHORNAME: AUSTIN\BLDG1
856
VPN ID:
870
PHYSICAL NETWORK ADDRESS: 10.7.205.103
854
CUSTOMER ANCHORNAME: AUSTIN\BLDG2
858
VPN ID:
872
878
CHANGE VPN ID FOR ENTIRE SCOPE
SET
874
876
CLEAR

FIG. 8

```
Public Class IPActionObject {

        Endpoint sourceEP;
        Endpoint targetEP;

        // CONSTRUCTOR
        IPActionObject( Endpoint targetEP, Endpoint sourceEP ) {
        .
        .
        .
        }
        VOID performAction( ) // EXECUTES ACTION METHOD
.
.
.
}
```

FIG. 6B

```
Public Class Endpoint {

        // public variables
        long    EPObjectID; // ID to object (both private and public network addresses)
        InetAddress  EPIPAddress;       // physical network address (private or public)
        long    EPVPN;      // virtual private network ID

        //get/set of variables
        public long          getObjectID( ) { ... }
        public InetAddress   getPAddress( ) { ... }
        public long          getVPN( ) { ... }

}
```

FIG. 6C

```
Public Class EndpointCustomer extends Endpoint {

        public getVPNGW( ) {
                //gets the only gateway which has access to a particular private network
        .
        .
        .
        }
        //private variables only set/accessed by EP creator IPOP
        long    customerHashNumber;
        String customerName;
        String customerAnchorPath;
        Long   objectIoFPrivateGatewayRoute

}
```

FIG. 6D

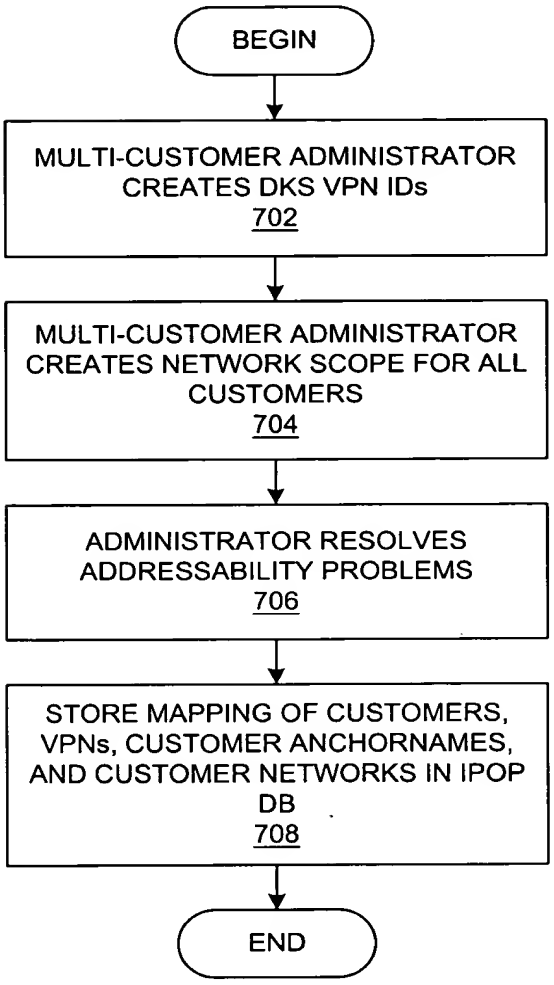

FIG. 7A

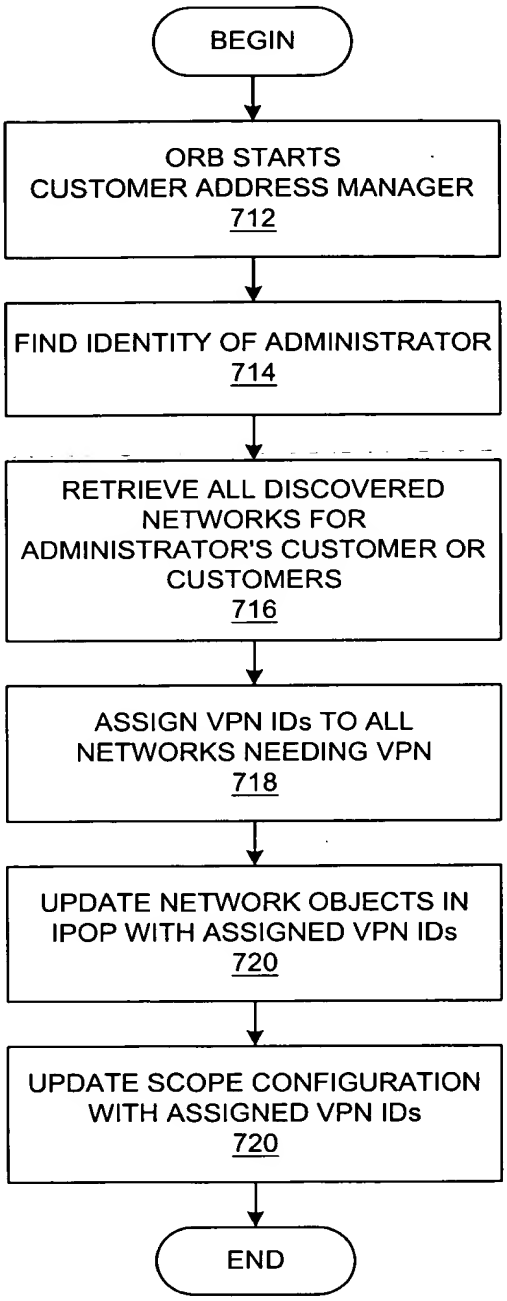

FIG. 7B

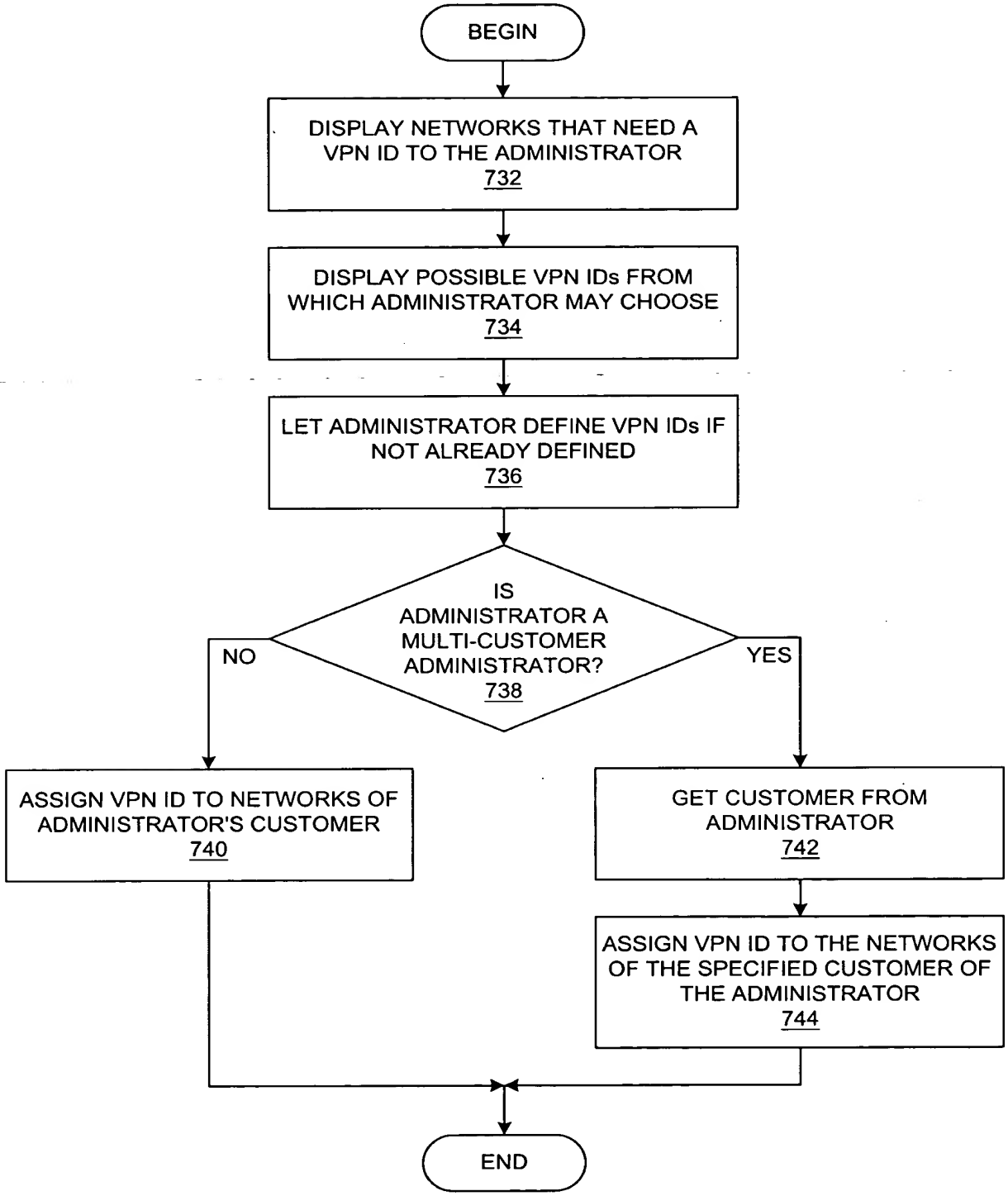
BEGIN
DISPLAY NETWORKS THAT NEED A VPN ID TO THE ADMINISTRATOR
732
DISPLAY POSSIBLE VPN IDs FROM WHICH ADMINISTRATOR MAY CHOOSE
734
LET ADMINISTRATOR DEFINE VPN IDs IF NOT ALREADY DEFINED
736
IS ADMINISTRATOR A MULTI-CUSTOMER ADMINISTRATOR?
738
NO
YES
ASSIGN VPN ID TO NETWORKS OF ADMINISTRATOR'S CUSTOMER
740
GET CUSTOMER FROM ADMINISTRATOR
742
ASSIGN VPN ID TO THE NETWORKS OF THE SPECIFIED CUSTOMER OF THE ADMINISTRATOR
744
END

FIG. 7C

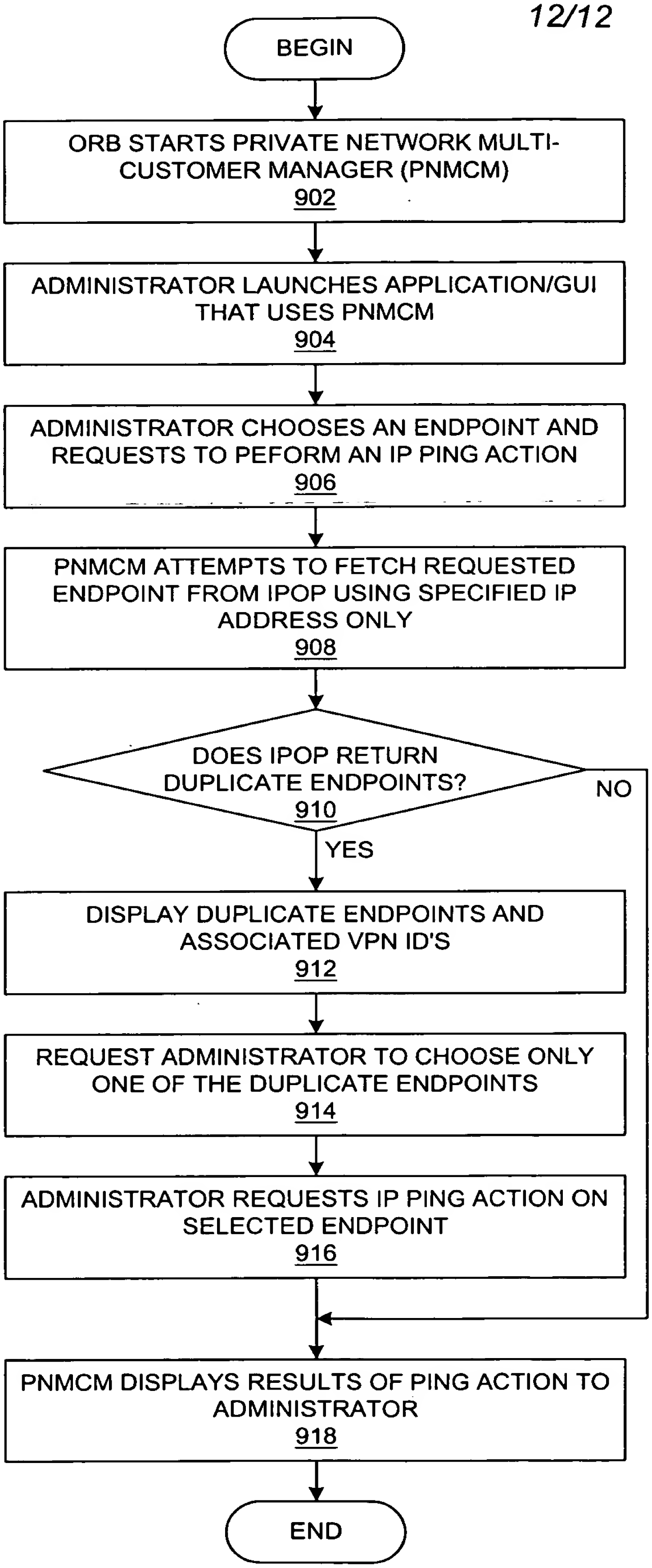
BEGIN
ORB STARTS PRIVATE NETWORK MULTI-CUSTOMER MANAGER (PNMCM) 902
ADMINISTRATOR LAUNCHES APPLICATION/GUI THAT USES PNMCM 904
ADMINISTRATOR CHOOSES AN ENDPOINT AND REQUESTS TO PEFORM AN IP PING ACTION 906
PNMCM ATTEMPTS TO FETCH REQUESTED ENDPOINT FROM IPOP USING SPECIFIED IP ADDRESS ONLY 908
DOES IPOP RETURN DUPLICATE ENDPOINTS? 910
NO
YES
DISPLAY DUPLICATE ENDPOINTS AND ASSOCIATED VPN ID'S 912
REQUEST ADMINISTRATOR TO CHOOSE ONLY ONE OF THE DUPLICATE ENDPOINTS 914
ADMINISTRATOR REQUESTS IP PING ACTION ON SELECTED ENDPOINT 916
PNMCM DISPLAYS RESULTS OF PING ACTION TO ADMINISTRATOR 918
END

FIG. 9A

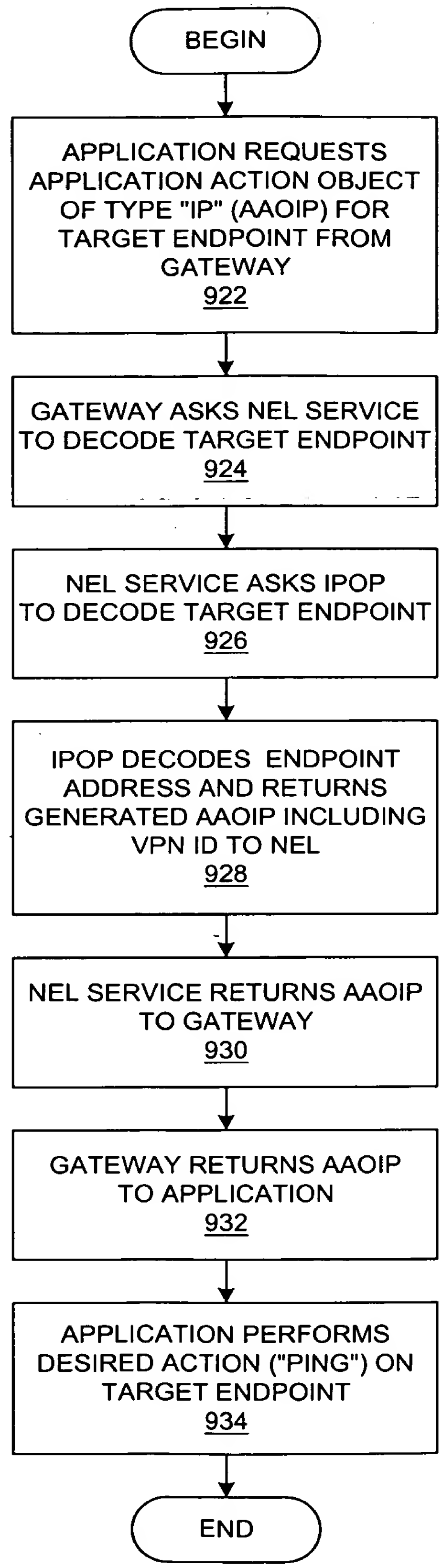
BEGIN
APPLICATION REQUESTS APPLICATION ACTION OBJECT OF TYPE "IP" (AAOIP) FOR TARGET ENDPOINT FROM GATEWAY 922
GATEWAY ASKS NEL SERVICE TO DECODE TARGET ENDPOINT 924
NEL SERVICE ASKS IPOP TO DECODE TARGET ENDPOINT 926
IPOP DECODES ENDPOINT ADDRESS AND RETURNS GENERATED AAOIP INCLUDING VPN ID TO NEL 928
NEL SERVICE RETURNS AAOIP TO GATEWAY 930
GATEWAY RETURNS AAOIP TO APPLICATION 932
APPLICATION PERFORMS DESIRED ACTION ("PING") ON TARGET ENDPOINT 934
END

FIG. 9B